

**MIDDLE ATLANTIC  
Region 1  
HHS-N-276-2011-00003-C  
Evaluating MedlinePlus Connect 2  
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01-OCT-2011-30-APR-2012  
Special Funding Initiative: No  
NN/LM Project Final Report  
Report Submitted: 06-JUL-2012**

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## **Executive Summary**

The Institute for Family Health (IFH), which had worked over a period of three years with the MedlinePlus staff of the National Library of Medicine (NLM) to create MedlinePlus Connect, undertook to study MedlinePlus Connect usage and usability by a predominantly underserved patient population in the first year of MedlinePlus Connect's announced availability. IFH is a network of Federally Qualified Health Centers ([www.institute2000.org](http://www.institute2000.org)) that implemented Epic's ambulatory care system in 2002, Epic's patient portal MyChartMyHealth in 2008, and MedlinePlus Connect as it was being developed. Partners in implementing the current study of the first full year of use of MedlinePlus Connect were Columbia University's Department of Biomedical Informatics and Weill-Cornell Medical College's Center for Healthcare & Informatics Policy. The overall goal of the project was to determine what kinds of information/feedback a) could be obtained from routine implementation of MedlinePlus Connect and b) would be most useful to the MedlinePlus Connect team as they continue to develop and evolve MedlinePlus Connect.

The project's results include a statistical analysis of patient adoption and usage of MedlinePlus Connect (Attachment 1) and a study of MedlinePlus Connect's usability (Attachment 2).

Of the 13,115 Institute patients with active MyChartMyHealth accounts, 4,788 (36.5%) explored one or more MedlinePlus Connect links. Compared to all MyChartMyHealth users, patients who used MedlinePlus Connect were slightly more likely to be women, less likely to be white, more likely to be Hispanic, less likely to have private insurance and more likely to have Medicaid, and more likely to be speakers of English. They had more chronic conditions on average, and specifically were more likely to have depression, asthma, diabetes, or chronic hepatitis than non-MedlinePlus Connect users.

Thirteen Institute patients were recruited to participate in usability testing of MedlinePlus Connect. All patients were age 18 or over, had not attended college, spoke English, and had an existing appointment at a health center. Patient recruitment was specifically focused on patients with limited formal education as a proxy measure for low health and/or computer literacy in order to best identify barriers to the use of MedlinePlus Connect for this population. The usability testing centered on diagnoses/problems, medications, and test results. Some specific problems were identified with linking, which may require modifications on the part of the portal developers, as well as problems with specific linkages and navigation on MedlinePlus Connect. The patients who participated in the usability testing were generally enthusiastic about MedlinePlus Connect.

We conclude that MedlinePlus Connect is being used regularly by a relatively constant subset of the patients who have MyChartMyHealth accounts. We propose to continue to work with the NLM MedlinePlus team in this formative evaluation, and also to try to increase the use of MedlinePlus Connect links by IFH patients by creating "just-in-time" videos for MyChartMyHealth and developing classes.

### **Minority Populations Served**

African Americans: Yes  
American Indians/Alaska Natives: No  
Asian Americans: No  
Hispanics/Latinos: No  
Native Hawaiians and Pacific Islanders: Yes  
Other: No

## **Approaches and Interventions Used**

The project team utilized both quantitative and qualitative methods for this project. The specific methods are described in the project findings located at Attachments 1 and 2.

## Evaluation Activities

This project was evaluated using process measures. As a pilot study, our goal was to demonstrate that we could successfully track the use of MedlinePlus Connect among patients using the Institute's EHR-based patient portal and analyze the resulting data, as well as to develop and test a MedlinePlus Connect usability testing protocol among low-literacy patients. We did track and continue to track patient use of MedlinePlus Connect. We have developed comprehensive usage reports which incorporate de-identified patient demographic and clinical data, with only one problem as identified in the Problems or Barriers Encountered section. These reports enable us to determine the rate at which patients use MedlinePlus Connect and the types of information they seek. They also enable us to identify characteristics of patients who: 1) do not use the patient portal; 2) use the patient portal and MedlinePlus Connect; or 3) use the patient portal and do not use MedlinePlus Connect.

In previous portal-related usability testing conducted by the project team, demographic questionnaires completed by participants identified them as having high levels of formal education. The protocol developed for this project excluded patients with formal education beyond high school in order to identify potential barriers to use of MedlinePlus Connect most likely to be experienced by those with lower levels of health literacy and computer literacy. We successfully recruited 13 patients who met this criterion into our pilot test of the usability testing protocol and identified specific, actionable obstacles to their successful use of MedlinePlus Connect.

## **Problems or Barriers Encountered**

The most significant problem encountered in this project was a system error that precluded the analysis of MedlinePlus Connect use for patients logging into the English language version of the patient portal versus the Spanish version of the portal. The program to track MedlinePlus Connect use from the Institute's portal was intended to capture the entire code used to link patients to the specific MedlinePlus page. An unintended systematic truncation of the code eliminated the website language code which was located at the end of each coding string. Data on patients' preferred language as documented in the medical record was available for analysis and is included in the report at Attachment 1; however, data on the portal site (English vs. Spanish) from which patients actually accessed MedlinePlus Connect was not available. This problem has been corrected, but the data could not be recovered retroactively.

## **Continuation Plans**

With the MedlinePlus Connect tracking program now in place, we will continue to track the use of MedlinePlus Connect among the Institute's patients. These data can be retrieved and analyzed as needed using report templates that were developed during this project.

After identifying specific barriers to patient use of MedlinePlus Connect, we now seek to work with the NLM MedlinePlus team to make relatively minor but important modifications to the linkages. Changes in the page layout and instructions could greatly improve ease of use for patients. We plan to work in partnership with NLM to make these modifications and conduct usability testing to determine whether changes have enhanced the patient experience. We will seek additional funding from NLM for this purpose.

## Impact

MedlinePlus Connect is a very important resource in the evolving world of health information technology. It can help adopters of EHRs meet Meaningful Use criteria by providing a resource for patient education.

Yet this project has revealed that MedlinePlus Connect presents usability problems to low-education patients. Further usability analyses are needed to give the NLM MedlinePlus Connect team guidance about how usability could be improved. Further, this needs to be done as a working partnership in which MedlinePlus Connect team members participate – either remotely or in person – in some of the usability testing. As an example, we learned that patients were distracted and confused by the prominent boxed announcement “Drug Information is brought to you by the American Society of Health-System Pharmacists.” adjacent to the ASHP Logo.

We have demonstrated that it is possible to track the usage of MedlinePlus Connect and to relate clicks to MedlinePlus Connect with patient characteristics including demographics and health status. Further exploratory work is needed to develop hypotheses about the use and non-use of MedlinePlus Connect, and to develop methods for increasing MedlinePlus Connect’s usage such as classes and “just-in-time” videos.

The partnership between the Institute for Family Health and the MedlinePlus Connect team enables the National Library of Medicine to obtain critical formative feedback in the development and evolution of MedlinePlus Connect that will result in design changes that will benefit all of the EHR community, including providers, patients and EHR vendors.



## Lessons Learned

This collaborative project of The Institute for Family Health, Columbia University's Department of Biomedical Informatics, and the Weill-Cornell Medical College's Center for Healthcare & Informatics Policy was funded to pilot test methods of obtaining information/feedback from routine implementation of MedlinePlus Connect that would be useful to the MedlinePlus Connect team as they continue to develop and evolve MedlinePlus Connect. The project team successfully obtained and analyzed data from a program to track patient use of MedlinePlus Connect from within the Institute's patient portal. This analysis revealed that 36.5% of the Institute's 13,115 patients with active MyChartMyHealth accounts explored one or more MedlinePlus Connect links. Compared to all MyChartMyHealth users, patients who used MedlinePlus Connect were slightly more likely to be women, less likely to be white, more likely to be Hispanic, less likely to have private insurance and more likely to have Medicaid, and more likely to be speakers of English. They had more chronic conditions on average, and specifically were more likely to have depression, asthma, diabetes, or chronic hepatitis than non-MedlinePlus Connect users.

The project team also demonstrated the successful implementation of a MedlinePlus Connect usability testing protocol that focused recruitment on patients with limited formal education as a proxy measure for low levels of health literacy and computer literacy. This recruitment strategy was intended to identify barriers to use of MedlinePlus Connect among high need patients, as well as possible solutions. Several relatively minor but important modifications to MedlinePlus Connect webpage layouts are recommended. Medical terminology continues to pose challenges to patients' understanding of health conditions and treatment recommendations, and clear, simple patient instructions for navigating within the portal and MedlinePlus Connect are needed in order for patients of a Federally Qualified Health Center to successfully use of this important resource.

## **Other**

Report Attachments 1 and 2 are being sent separately to the project officer.

**Attachment 1: AR summary data: Subcontractor activities**